

**ORIGINAL**

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

**ORIGINAL  
FILE**

In the Matter of )  
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CRESCOMM TRANSMISSION SERVICES )  
 )  
Petition for Rule Making to Amend )  
Part 80 of the Commission's Rules )  
and to Reallocate Spectrum of the )  
Fixed-Satellite Service for Use by )  
Digital Shipboard Earth Stations )

RM-7912

**RECEIVED**

**APR 10 1992**

Federal Communications Commission  
Office of the Secretary

**COMMENTS OF**  
**COMMUNICATIONS SATELLITE CORPORATION**

Communications Satellite Corporation (COMSAT) hereby submits the following comments in response to the petition for rulemaking filed by Crescomm Transmission Services (Crescomm) seeking amendment of Part 80 of the Commission's Rules, 47 C.F.R. Part 80, and reallocation of certain frequencies to permit the operation of digital shipboard earth stations (DSES) in ocean, sea, and coastal areas. COMSAT believes that customers should have the option to choose among a variety of telecommunications suppliers to satisfy their communications needs. Consequently, we encourage the Commission to institute a rulemaking proceeding to establish new rules and procedures that would permit DSES and other DSES type stations to operate in the maritime environment by communicating with fixed earth stations on land via appropriate satellites.

If shipboard DSES type stations are to be commercially viable, they must operate without interference to Fixed (FS) and Fixed

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Satellite (FSS) services, as well as to other services now operating in the proposed frequency bands<sup>1</sup>. Thus, any rulemaking proceeding the Commission conducts must successfully address several spectrum management issues. While mobile-satellite earth stations are not now permitted in any of the frequency bands Crescomm proposes, COMSAT believes that a rulemaking can establish appropriate rules and procedures for operation of such stations within the C- and Ku bands. In our view, the key to successful implementation of this new service is the process the Commission follows in establishing the appropriate sharing criteria to avoid harmful interference and in gaining recognition of DSES type terminals as legitimate operations under the International Radio Regulations of the International Telecommunication Union (ITU). A considerable body of protection criteria for both Fixed and FSS already exists in CCIR Reports and Recommendations, which can be drawn upon in this effort. In the sections below, COMSAT provides its suggestions for authorization of this service, along with some observations regarding the interference issues the Commission will need to resolve.

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<sup>1</sup> In its petition, Crescomm states that its proposed DSES would communicate with fixed and temporary-fixed stations using the bands 5.925- 6.425 GHz and 14-14.5 GHz (transmit) and 3.7-4.2 GHz 11.7-12.2 GHz (receive). While these bands are allocated in the U.S. National Table mainly for Fixed and FSS, this spectrum is allocated to a variety of other services under the International Table of Allocations, including Broadcasting, Mobile, Broadcasting Satellite Sound, and Radionavigation. Crescomm and other DSES type service providers must be able to operate without interference to these other services.

## I. INTERNATIONAL REGULATORY CONSIDERATIONS

Fixed microwave relay stations, earth stations on land, and satellite stations in orbit operating in the FSS service have successfully shared the C-band frequencies on a global basis for over 25 years. Throughout this period, administrations worked to develop the international and domestic rules and procedures which currently govern the coordination of this shared use. The International Table of Frequency Allocations in the Radio Regulations reflect treaty agreements reached at World Administrative Radio Conferences (WARC) to allocate these bands to the FSS service on a shared basis with terrestrial radio relay stations. As a signatory to the Radio Regulations, the United States has an obligation to assure that U.S. operations are consistent with the provisions of the Radio Regulations and to avoid harmful interference among stations operating in accordance with these international regulations.<sup>2</sup> There are, however, no specific rules or procedures governing the coordination of mobile earth stations on board ships operating in the proposed C or Ku-bands. Such rules have not been developed due to the complexity of establishing a coordination area associated with a mobile earth station.

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<sup>2</sup> Radio Regulation No. 342, states that ITU member nations "shall not assign to a station any frequency in derogation of ... the Table of Frequency Allocations ... except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations."

It is unclear from the instant petition exactly what kind of action Crescomm is seeking with regard to immediate or future changes to the Radio Regulations. COMSAT is unable to discern, for example, whether Crescomm is requesting that the Commission authorize DSES type stations to operate in the FSS service using the Fixed/FSS frequency bands or whether Crescomm is asking the Commission to reallocate the proposed bands to the mobile-satellite service (MSS) as well as to the FSS service. The Commission's Public Notice<sup>3</sup> appears to assume a reallocation. There is a significant difference, however, between a reallocation proceeding, such as the one the Commission conducted in preparation for the WARC-92 Conference, and a much simpler proceeding to address the question of permitting DSES type stations on ships at sea and in coastal areas to operate in the FSS frequency bands. Even under the latter approach, there is a significant difference between proposing to operate these stations on a "not to interfere" basis and proposing to operate as authorized stations recognized in the Radio Regulations as the type of operations intended within these bands. COMSAT believes that the Commission should address this issue and determine the proper course of action.

## II. RECOMMENDED COURSE OF ACTION

COMSAT believes it is possible to allow the maritime DSES

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<sup>3</sup> Public Notice, Petition for Rule Making and Pioneer's Preference Filed, Mimeo No. 22204, Mar. 11, 1992.

service to go forward and also, over time, obtain international recognition of these mobile terminals as fully authorized stations. The following four-step approach represents one method of achieving this goal.

As an initial step, the Commission should assess the interference potential of DSES type stations and develop appropriate sharing criteria, based upon industry comments and applicable CCIR Recommendations and Reports. This assessment is important to the future of this type of service -- if the probability of interference is too great these DSES stations may not be commercially viable in the proposed bands.<sup>4</sup> There are three types of interference the Commission needs to consider: (1) interference from DSES to radio relay stations on land along coasts or on islands, e.g., in the Caribbean; (2) interference from DSES to fixed satellite earth stations in the FSS and to satellites in the FSS; and (3) interference to DSES from fixed radio relay stations and FSS stations.

COMSAT has some initial observations regarding the interference potential of the DSES stations. From the limited information available, it appears that shipboard terminals operating at C-band on the high seas seem to present little, if

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<sup>4</sup> In order to better assess the interference environment, COMSAT World Systems recently filed with the Commission a tariff offering INTELSAT space segment at no charge for up to 60 days for tests and demonstrations of C-band mobile service. See Transmittal No. 947, filed April 7, 1992.

any, threat of interference to terrestrial services. However, as these vessels approach shore, it appears that terrestrial fixed radio relay stations situated in coastal areas or near shipping lanes may be susceptible to line-of-sight (LOS) interference from a DSES type station. This interference may be such that a DSES could not operate on a co-channel basis within LOS of the main beam of a terrestrial fixed microwave receiver operating at C-band even with a considerable elevation angle.

With respect to adjacent satellite interference, the preliminary outlook seems more favorable. Our threshold analysis seems to indicate that the type of interference that adjacent FSS satellites are likely to experience, i.e., off-axis radiation from the ship terminal illuminating the uplinks of other C-band FSS satellites, would be within the CCIR limits set forth in CCIR Recommendation 524-3, if the shipboard antenna is pointed properly. In this regard, it seems that the degree to which harmful interference will occur depends on the ability of DSES operators to track and keep the ship terminal main beam centered on the appropriate satellite. At C-band, DSES operators would need to keep the DSES antenna pointing accuracy to within  $0.5^\circ$  or better, in varying sea state conditions, in order to stay within the 3 dB roll-off points of the typical 3 meter VSAT antenna.<sup>5</sup> Tracking

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<sup>5</sup> A typical 3 meter VSAT antenna operating at C-band has a beamwidth of approximately  $1.2^\circ$ . In comparison, INMARSAT-A L-band antennas have much broader 3 dB beamwidths, approximately  $15^\circ$ . Thus, the tracking requirements for these antennas are not nearly so critical as at C-band.

requirements would be correspondingly more stringent at Ku-band, due to more narrow beamwidths at this frequency range.

Once the Commission has completed its interference assessment, it should proceed promptly to authorize DSES type stations to operate commercially on a "not to interfere" basis with the requirement that DSES operators have the means to cease transmissions immediately in situations where such station is causing harmful interference to sanctioned users.<sup>6</sup> In order to implement this shutdown capability, the Commission will need to devise some method of assuring that a DSES terminal causing interference can be readily identified and the licensee notified of the problem so that the offending transmitter can be shut down immediately.<sup>7</sup> In this regard, COMSAT believes the Commission should not alter the current licensee eligibility requirements for ship earth stations.

As a third step, the Commission should prepare to initiate the

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<sup>6</sup> In the case of U.S. registered vessels operating in the territorial waters of other nations, the Commission may need to facilitate coordinations with those countries in order to ensure the viability of any shut down capability. However, the majority of ships that potentially may operate the DSES terminals (particularly cruise ships) are of foreign registry. The country of registry, therefore, would be responsible for licensing such terminals. This represents another reason why it is so important for this matter to be dealt with eventually at the international level.

<sup>7</sup> The Commission may wish to consider requiring the inclusion of automatic transmitter identification codes in all DSES transmissions.

domestic and international processes required to establish DSES type terminals as stations authorized to operate under the Radio Regulations in particular bands of the FSS Service. The Commission would need to develop parameters for these stations and establish procedures for coordinating such stations with Fixed, FSS, and the other services currently utilizing the particular C and Ku-band segments. Finally, after Crescomm and other service providers have had time to test the commercial success of the DSES type service, the Commission should evaluate the desirability and feasibility of reallocating the proposed FSS bands to MSS and FSS and proceed, if warranted, in obtaining international acceptance of such a reallocation at an appropriate future WARC.

### III. CONCLUSION

COMSAT supports the initiation of a rulemaking proceeding to establish new rules and develop appropriate coordination procedures to license maritime mobile DSES types terminals in frequency bands now allocated to Fixed and FSS. We believe that such a rulemaking should establish the technical basis to authorize DSES terminal operations without harmful interference to other users operating in accordance with the International Radio Regulations.


In our view, the multi-stage approach outlined herein, which takes into account the international nature of the proposed operations, is most likely to succeed in establishing this new



service in an a prompt, yet orderly manner. Such an approach would set the stage for operations to go forward without awaiting the final step of reallocation of services and frequencies in the International Radio Regulations and in the Commission's Rules, assuming that the Commission decides in the future that a reallocation is both desirable and feasible.

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

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